Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended)   A method for creating a computer model of diabetes, comprising:

identifying data relating to diabetes, the data relating changes in biological states to biological attributes of diabetes;

identifying a plurality of biological processes related to the data, the plurality of biological processes defining at least one portion of the disease state of diabetes; and

combining the plurality of biological processes to form a simulation of glucose metabolism, wherein the simulation comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin.

2. (original)   The method of claim 1, further comprising:

producing a simulated biological attribute associated with at least one biological attribute of diabetes from the combined plurality of biology processes based on the combined plurality of biology processes;

comparing the simulated biological attribute with a corresponding biological attribute associated with a reference pattern of diabetes; and

identifying the computer model as a valid computer model of diabetes if the simulated biological attribute is substantially consistent with the biological attribute associated with a reference pattern of diabetes.

3. (currently amended)   The method of claim 1, wherein ~~the~~ combining the plurality of biological processes includes:

forming a first mathematical relation among biological variables associated with a first biological process from the plurality of biological processes; and

forming a second mathematical relation among biological variables associated with the first biological process and a second biological process from the plurality of biological variables associated with the plurality of biological processes.

4. (original)   The method of claim 3, further comprising:

creating a set of parametric changes in the first mathematical relation and the second mathematical relation; and

producing a simulated biological attribute based on at least one parametric change from the set of parametric changes, the simulated biological attribute being substantially consistent with at least one biological attribute associated with a reference pattern of diabetes.

5. (original)   The method of claim 3, further comprising:

creating a set of parametric changes in the first mathematical relation and a set of parametric changes in the second mathematical relation, the set of parametric changes in the first mathematical relation being associated with a first diabetes defect having its own degree of severity, the set of parametric changes in the second mathematical relation being associated with a second diabetes defect having its own degree of severity.

6. (original)   The method of claim 3, further comprising

converting at least one biological variable from the group of the first mathematical relation or second mathematical relation into a biological variable that evolves over time; and

producing a series of simulated biological attributes based on the converted biological variable, the series of simulated biological attributes being substantially consistent with a corresponding biological attribute associated with a reference pattern of diabetes, the series of simulated biological attributes representing the disease progression in the reference pattern of diabetes.

7. (currently amended)   A computer model of a disease state of diabetes, comprising:

a computer-readable memory storing:

instructions defining a set of biological processes related to the disease state of diabetes, at least two biological processes from the set of biological processes being associated with a set of mathematical relationships related to interactions among biological variables associated with the biological processes, the instructions defining a simulation of glucose metabolism, wherein the simulation comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin;

and a processor coupled to the computer-readable memory, the processor configured to execute the instructions.

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8. (original)   The computer model of claim 7, wherein, upon execution of the instruction, the processor is configured to produce a simulated biological attribute for the disease state of diabetes, the simulated biological attribute is substantially consistent with at least one biological attribute associated with a reference pattern of diabetes.

9. (original)   The computer model of claim 7, wherein the instructions further define a set of defects associated with diabetes, the set of defects including a first defect and a second defect, the first defect is a modification of a first biological process from the set of biological processes, the first biological process is related to biological attributes of diabetes in a reference pattern of diabetes, the second defect is a modification of the first biological process or a second biological process from the set of biological processes, the second biological process is related to biological attributes of diabetes in the reference pattern of diabetes.

10. (currently amended)   A computer-readable medium having computer-readable instructions stored thereon that, upon execution by a processor, cause the processor to model a disease state of diabetes, the instructions comprising:

defining a normal biological state through a set of biological processes, each biological process from the set of biological processes having its own associated parameter set, the set of biological processes being related to glucose metabolism, wherein the set of biological processes comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization;

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of

amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin; and

providing a plurality of predefined defect indicators, each predefined defect indicator from the plurality of predefined defect indicators being uniquely associated with a defect from a plurality of defects associated with a disease state of diabetes, each defect from the plurality of defects being associated with at least one biological process from the set of biological processes; and

receiving a user-specified identification of a first defect indicator from the plurality of predefined defect indicators, a first defect from the plurality of defects being associated with the first defect indicator, the parameter set associated with each biological processes that is associated with the first defect being changed based on the user-specified identification.

11. (previously presented)   The computer-readable medium of claim 10, wherein the instructions further comprise:

determining at least one simulated biological attribute based on the modified biological process associated with the first defect, the simulated biological attribute being substantially consistent with at least one corresponding biological attribute associated with diabetes in a reference pattern of diabetes.

12. (previously presented)   The computer-readable medium of claim 10, wherein the instructions further comprise:

receiving a user-specified identification of a second defect indicator from the plurality of predefined defect indicators, a second defect from the plurality of defects being associated with the second defect indicator, the parameter set associated with each biological processes that is associated with the second defect being changed based on the user-specified identification.

13. (previously presented)   The computer-readable medium of claim 12, wherein:

the first defect has an associated severity based on the change to the at least one associated parameter set; and

the second defect has an associated severity based on the change to the at least one associated parameter set, the severity associated with the first defect being different from the severity associated with the second defect.

14. (previously presented)   The computer-readable medium of claim 12, wherein:

the first defect has an associated severity based on the change to the at least one associated parameter set; and

the second defect has an associated severity based on the change to the at least one associated parameter set, the severity associated with the first defect being substantially similar to the severity associated with the second defect.

15. (previously presented)   The computer-readable medium of claim 10, wherein the instructions further comprise:

producing a simulated biological attribute based on the parameter set associated with each biological processes that is associated with the first defect, the simulated biological attribute being substantially consistent with biological attributes of a reference pattern of diabetes.

16. (currently amended)   A computer-readable medium having computer-readable instructions stored thereon that, upon execution by a processor, cause the processor to model a disease state of diabetes, the instructions comprising:

providing a plurality of predefined defect indicators, each predefined defect indicator from the plurality of predefined defect indicators being uniquely associated with a defect from a plurality of defects associated with a disease state, each defect from the plurality of defects being associated with at least one biological process from a set of biological processes, the set of biological processes being related to glucose metabolism, wherein the set of biological processes comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological

process selected from the group consisting of regulation of adipose tissue uptake of free

fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride

esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin;

receiving a user-specified identification of a first defect indicator from the plurality of predefined defect indicators, a first defect from the plurality of defects being associated with the first defect indicator, the first defect being associated with at least one biological process and its associated parameter set, the at least one parameter set associated with the first defect being changed based on the user-specified identification; and

receiving a user-specified identification of a second defect indicator from the plurality of predefined defect indicators, a second defect from the plurality of defects being associated with the second defect indicator, the second defect being associated with at least one biological process and its associated parameter set, the at least one parameter set associated with the second defect being changed based on the user-specified identification.

17. (previously presented)   The computer-readable medium of claim 16, wherein:

the first defect having an associated severity based on the change to the at least one associated parameter set, the second defect having an associated severity based on the change to the at least one associated parameter set, the severity associated with the first defect being different from the severity associated with the second defect.

18. (previously presented)   The computer-readable medium of claim 16, wherein the instructions further comprise:

defining a normal biological state through the set of biological processes, each biological process from the set of biological processes being associated with its own parameter set.

19. (previously presented)   The computer-readable medium of claim 16, wherein the plurality of defects are associated with type 2 diabetes.

20. (currently amended)   A computer-readable medium having computer-readable instructions stored thereon that, upon execution by a processor, cause the processor to model a disease state of diabetes, the instructions comprising:

defining a plurality of biological processes related to a disease state of diabetes, wherein the plurality of biological processes comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin;

the step of defining including:

defining a set of mathematical relations associated with a first biological process from the plurality of biological processes and associated with interactions among biological variables associated with the first biological process, and

defining a set of mathematical relations associated with a second biological process from the plurality of biological processes and associated with interactions among biological variables associated with the second biological process,

a first biological process from the plurality of biological processes being associated with metabolism of at least two from the group of carbohydrates, fats and proteins, a second biological process from the plurality of biological processes being associated with metabolism of glucose.

21. (previously presented)   The computer-readable medium of claim 20, wherein the instructions further comprise:

defining a set of parametric changes for a first biological process; and

receiving a user-specified identification of a first defect indicator from a plurality of predefined defect indicators, the first defect indicator from the plurality of defect indicators being uniquely associated with a first defect from a plurality of defects that is associated with a disease state of diabetes, the set of parametric changes being changed based on the user-specified identification.

22. (previously presented)   The computer-readable medium of claim 21, wherein the instructions further comprise:

receiving a user-specified identification of a second defect indicator from the plurality of predefined defect indicators, the second defect indicator from the plurality of defect indicators being uniquely associated with a second defect from the plurality of defects that is associated with the disease state of diabetes, the second defect being associated with at least one biological process and its associated parameter set, the at least one parameter set associated with the second defect being changed based on the user-specified identification,

the first defect having an associated severity based on the change to the at least one associated parameter set, the second defect having an associated severity based on the change to the at least one associated parameter set, the severity associated with the first defect being different from the severity associated with the second defect.

23. (previously presented)   The computer-readable medium of claim 20, wherein the instructions further comprise:

receiving a user selection of a link representation from a set of predefined link representations, each predefined link representation in the set of predefined link representations

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being associated with a different mathematical relationship, the user-selected link representation being associated with the interrelationship between a first biological variable and a second biological variable,

a first link representation from the set of predefined link representations being a representation of the first biological variable having an effect on the second biological variable,

a second link representation from the set of predefined link representations being a representation of instances of the first biological variable being converted to instances of the second biological variable.

24. (currently amended)   A method for creating a computer model of diabetes, comprising:

receiving a plurality of user-selected indications to define a plurality of biological processes, each biological process from the plurality of biological processes being based on data that relates to changes in biological states to biological attributes of diabetes, wherein the plurality of biological processes comprises a representation of two macronutrient metabolisms selected from the group consisting of fat metabolism, protein metabolism and carbohydrate metabolism, wherein

a representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a representation of protein metabolism comprises a representation of at least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin;

producing a representation of the plurality of biological processes based on the user-selected indications, the plurality of biological processes defining at least one portion of the disease state of diabetes;

producing a simulated biological attribute associated with at least one biological attribute of diabetes based on the combined plurality of biology processes; and assessing a validity of the computer model based on a comparison between the simulated biological attribute and a corresponding biological attribute associated with a reference pattern of diabetes.

25. (currently amended)   A method for creating a computer model of diabetes, comprising:

identifying data relating to diabetes, the data relating changes in biological states to biological attributes of diabetes;

identifying a plurality of biological processes related to the data, the plurality of biological processes defining at least one portion of the disease state of diabetes; and

combining the plurality of biological processes to form a simulation of at least one biological attribute of diabetes, wherein the simulation comprises a representation of fat metabolism, wherein the representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization.

26. (currently amended)   A method for creating a computer model of diabetes, comprising:

identifying data relating to diabetes, the data relating changes in biological states to biological attributes of diabetes;

identifying a plurality of biological processes related to the data, the plurality of biological processes defining at least one portion of the disease state of diabetes; and

combining the plurality of biological processes to form a simulation of at least one biological attribute of diabetes, wherein the simulation comprises a representation of protein metabolism, wherein the representation of protein metabolism comprises a representation of at

least one biological process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin.

27. (currently amended)   A computer model of a disease state of diabetes, comprising:

a computer-readable memory storing:

instructions defining a set of biological processes related to the disease state of diabetes, at least two biological processes from the set of biological processes being associated with a set of mathematical relationships related to interactions among biological variables associated with the biological processes, the instructions defining a simulation of at least one biological attribute of diabetes, wherein the simulation comprises a representation of fat metabolism, wherein the representation of fat metabolism comprises a representation of at least one biological process selected from the group consisting of regulation of adipose tissue uptake of free fatty acid, regulation of adipose tissue lipolysis, regulation of adipose tissue triglyceride esterification, hepatic lipoprotein regulation, muscle free fatty acid uptake, and muscle free fatty acid utilization; and

a processor coupled to the computer-readable memory, the processor configured to execute the instructions.

28. (currently amended)   A computer model of a disease state of diabetes, comprising:

a computer-readable memory storing:

instructions defining a set of biological processes related to the disease state of diabetes, at least two biological processes from the set of biological processes being associated with a set of mathematical relationships related to interactions among biological variables associated with the biological processes, the instructions defining a simulation of at least one biological attribute of diabetes, wherein the simulation comprises a representation of protein metabolism, wherein the representation of protein metabolism comprises a representation of at least one biological

process selected from the group consisting of production of amino acids from carbohydrate in muscle, hepatic gluconeogenesis from amino acid substrate, oxidation of amino acids in muscle, oxidation of amino acids in liver, and regulation of skeletal muscle protein turnover in response to a stimulus selected from activity, exercise, fat mass, dietary composition, and insulin; and

a processor coupled to the computer-readable memory, the processor configured to execute the instructions.

29. (previously presented)   The method of claim 1, wherein the simulation comprises a representation of carbohydrate metabolism and a representation of fat metabolism or protein metabolism.

30. (previously presented)   The method of claim 1, wherein the simulation comprises a representation of carbohydrate metabolism, fat metabolism and protein metabolism.

31. (previously presented)   The computer model of claim 7, wherein the simulation comprises a representation of carbohydrate metabolism and a representation of fat metabolism or protein metabolism.

32. (previously presented)   The computer model of claim 7, wherein the simulation comprises a representation of carbohydrate metabolism, fat metabolism and protein metabolism.

33. (previously presented)   The computer-readable medium of claim 10, wherein the set of biological processes comprises a representation of carbohydrate metabolism, protein metabolism and fat metabolism.

34. (previously presented)   The computer-readable medium of claim 16, wherein the set of biological processes comprises a representation of carbohydrate metabolism, protein metabolism and fat metabolism.

35. (previously presented)   The method of claim 25, wherein the simulation further comprises a representation of carbohydrate metabolism or protein metabolism.

36. (previously presented)   The method of claim 26, wherein the simulation further comprises a representation of carbohydrate metabolism or fat metabolism.

37. (previously presented)   The computer model of claim 27, wherein the simulation further comprises a representation of carbohydrate metabolism or protein metabolism.

38. (previously presented)   The computer model of claim 28, wherein the simulation further comprises a representation of carbohydrate metabolism or fat metabolism.